

# **Backward mapping and the big idea: Employing social constructionist theory in curriculum planning**

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## **Abstract**

*Omnipresent in educational discourse, constructivist learning theory is often misrepresented in the literature as a theory of instruction. Appearing as social or personal constructivism or a hybrid, underpinning it is a belief that learning manifests as the reorganisation of cognitive schemata. In recent years, there have been moves to rethink constructivist theory from a critical, realist-materialist perspective. The result has been the emergence of social constructionism. In this paper we argue that social constructionist theory is more useful as a theory to guide curriculum development. We cite evidence of our work with pre-service and practising teachers to support this argument.*

## **Introduction**

Constructivist learning theory seems to be omnipresent in contemporary educational discourse. It appears as social or personal constructivism or in hybrid forms. It is often misrepresented in the literature as a theory of instruction. Underpinning constructivist theory is the belief that learning manifests as the reorganisation or elaboration of cognitive schemata. This building and rebuilding of mental maps of the world is argued to go on regardless of whether formal instruction is taking place or not. In fact, it could be argued that constructivist theory marks a moment of ‘pedagogical uncertainty’, or lack of confidence in the unproblematic transmission of ideas from one person to another. It suggests that our maps are built out of our own struggle in understanding the world, and are not simple replications of the maps of others. As teacher educators, we have observed that pre-service teachers in our courses, often interpret constructivist learning theory as supporting or advocating a form of ‘teacher-free’ or ‘do-it-yourself’ pedagogy.

Not long after constructivism became popular as a learning theory, psychologists concerned with the ‘idealism’ of constructivism, sought to rethink constructivist theory from what they described as a critical-realist, and/or a pragmatic-materialist perspective, partly influenced by readings of Vygotsky (see for example, the essays in the pivotal volume by Nightingale & Cromby, 1999). The result has been the emergence of social constructionism. As a theory, it posits learning as the appropriation of social practices, or after Wittgenstein, ‘forms of life’ (Schwandt, 2003). Like constructivism, social constructionism is a theory of learning, or ‘knowledge production’, rather than teaching in the limited sense of cultural transmission. However, it is also a theory of subjectivity formation and inscription. When translated into classroom practice, it emphasizes embodied activity as both the process and purpose of learning. Thus, it is predicated on a notion that the results of learning are likely to be observable, without requiring tests of rarefied knowledge.

We notice an important congruence between the theory of social constructionism and the idea of backward mapping. Beginning with thinking about assessment, backward mapping, by virtue of its commitment to what achievement of the desired outcome will look like, invites a focus on the material aspect of learning. This is particularly true in teacher education, where the outcome of learning is not only knowledge, but a set of specialized practices. Consequently, we see backward mapping as a lever to rework curricula along more social constructionist lines.

In this paper we argue that social constructionist theory is more useful as a theory to guide curriculum development than the various forms of constructivism. To support our argument, we cite evidence of our work with pre-service and practising teachers.

### **Social Constructionism versus Constructivism**

The terms constructivism, social constructivism, and social constructionism are not used consistently within the literature of the educational field. Nor do they have necessarily common meanings when used across disciplines. Thus, in the literature of philosophy, psychology and pedagogy, we see some slippage between terms, and sometimes radically different definitions. Thus, the definitional distinctions we set up between the terms ‘Social Constructionism’ and ‘Constructivism’ for this paper, are not meant to be adjudicational or exegetic. Instead, they serve a more pragmatic purpose, to distinguish between learning theory predicated on the reorganisation of cognitive knowledge domains, and learning theory that is focused on changes in embodied practices. Such a distinction is consistent with Holland and Cole’s (1995) articulation of the difference between psychological theories built on schema theory, and those expounding discourse as a framework for understanding human development and learning. We see the later not as oppositional to the former, but as subsuming it. That is to say, what we advocate is a non-dualist epistemology that considers pedagogy to be focused on changing social practices, not simply rarefied knowledges. Such an agenda is obviously not new, and was probably most strongly advocated by Dewey (1897). However, the need to attend to this distinction seems pressing, as we frequently encounter pre-service teachers in our programs who conflate various forms of constructivism with that particular kind of student-centred progressivism that seems to require, inaccurately or otherwise, the teacher to abdicate from an active role in the classroom.

The problem we see with ‘constructivism’ as a blanket term, is that it actually refers to a range of competing epistemologies, which have different practical implications (Prawat, 1996). When constructivism is advocated without differentiation, then it is easy for pre-service teachers to adopt pedagogical practices that at their extreme involve a ‘teacher-free’ approach to learning. This type of approach fails to guarantee the veracity of any knowledge that is ‘constructed’ by the student (Seixas, 1993), and may in-fact result in ‘a pedagogy of neglect’ by mistaking the idea that student’s will construct their own knowledge of the world despite what we do (a theory about learning), for a set of pedagogical instructions. This has been our motivating concern.

Certainly, ‘social constructivist’ pedagogies construct the role of the teacher as a scaffolder of student learning, however the usage of this term slips between the idea of learning as the reconstitution of cognitive schemata, to learning as changes in observable behaviour. Thus, we prefer the term ‘social constructionist’, as it

necessarily places an emphasis on ‘construction’; not simply the changing of beliefs or ideas suggested by ‘constructivism’, but the appropriation of new practices alongside new ideas, suggested by the emphasis on observable ‘construction’ of material artefacts. It is this focus on material artefacts afforded by a social constructionist standpoint, that has suggested a relationship to backward mapping.

## **Backward Mapping and the Big Idea**

We have argued here that social constructionism as a theory of learning focuses on material products. In the classroom, the material objects are the assessment products that result from the teaching/learning experiences that the teacher sets up for the students. One of the major benefits of the outcome based education orthodoxy, and recent initiatives to develop Australian forms of ‘authentic pedagogy’, has been the recognition that assessment is a critical message system in education, and must align with the curriculum, and pedagogy message systems if learning is to be effective (Hayes, 2003). This is in contrast to external forms of assessment such as the Higher School Certificate and various standardised tests that position assessment as being separate from the teaching and learning process. Although we do not support the hyper-accountability that has accompanied the outcome based movement, we do support the move towards seeing assessment as being part of the teaching and learning process.

When assessment is realigned with curriculum and pedagogy there is a commensurate change in the planning process. Instead of asking the planning questions, *what to teach?* or *how to teach it?*, the teacher must also consider the question, *how do I know if the children have learnt anything?* Whilst this last question was always meant to be a part of the planning process, it was often considered only as a peripheral concern. We argue that this marginalisation of assessment was assisted by the initial prevarication of the NSW Board of Studies between an objectives based and outcomes based system. The initial focus on outcomes based education in syllabus documents published in the early 1990s (e.g. Science and Technology K-6, 1993) did not have as much impact as more recent moves to bolster the parent reporting process, such as student portfolios. The original K-6 Science and Technology curriculum document (1993) presents outcomes as little more than rephrased instructional objectives. This is evidenced by the appearance of specific outcomes for skills and values and attitudes with each sample unit of work. The revised outcomes and indicator document for Science and Technology K-6 (2000) gives clear precedence to content based outcomes that can be measured using assessment products. The old skills outcomes are subsumed under the three *learning processes* of investigating, designing and making and using technology. Reference is still made to values outcomes with this particularly banal statement:

Values and attitudes are an integral part of learning. The values and attitudes outcomes are different in nature from the stage outcomes. The values and attitudes outcomes are described separately on page 18 of this document. (NSW BOS, 2000 p.9)

For the purposes of our argument, it is fascinating to see values and attitudes outcomes described as being “different in nature”. Furthermore, the publication of a new outcomes and indicators document, *on its own*, nine years on from the publication of the original *complete* syllabus clearly demonstrates the ascendancy of

tangible, measurable outcomes over warm and fuzzy value statements in the last decade of the century. It is clearly much easier to construct an assessment product that demonstrates a content outcome than one that shows the achievement of a values and attitude outcome!

It is not our intention in this paper to denigrate values and attitudes outcomes in the school curriculum. It is our intention, however, to point out the practical benefits of working with more concrete outcomes in the development of curriculum. When the teacher has a clear object in mind for a sequence of lessons the planning process is a more focused operation. The practice of working back from the assessment product as the desired outcome to devise units of work has been described as backward mapping (Reid & Loughland, 2003). Backward mapping clearly places assessment as an equal partner to curriculum and pedagogy. In our work with practising and pre-service teachers we have observed the benefit of having a material object as the focus of planning. This in contrast to other modes of planning that we have taught and observed that are resource or process based and lead to inexplicit teaching. This is evidence for arguing for a constructionist rather than a constructivist theoretical base for teacher planning.

The major critique of outcomes based education is its inherent instrumentalism. We would argue the pragmatic line that backward mapping is the best response to a system obsessed by hyper-accountability. To us, there is a clear choice in opting for assessment products that come out of worthwhile learning experiences than the decontextualised judgments of standardised tests. Of course, backward mapping only works if the end product that is chosen is worthwhile. In recent consultative work with the Australian Government Quality Teacher Programme (AGQTP), one of the authors worked with teachers in clarifying the end products of their K-6 Science and Technology units of work. This quest was termed, *Looking for the Big Idea*, from the QTP CD-Rom created to help teachers plan for K-6 Science and Technology (Commonwealth of Australia, 2003). Looking for the big idea is really an effort on the teacher's part to translate the sometimes obscure language of outcomes and indicators into tangible assessment products. For example, the stage 3 outcome from the physical phenomena content strand is "PP S3.4 Identifies and applies processes involved in manipulating, using and changing the form of energy" (NSW BOS, 2000 p.27). For most primary school teachers in NSW, most without any background in high school physics, this outcome would be one to be avoided at all cost! To be fair to the Board of Studies, sample indicators are also provided for teachers, "determines, records and reports on the conditions necessary for an electrical circuit to operate, eg light a bulb" (NSW BOS, 2000 p.27). This indicator is probably the most common one chosen by Stage 3 (Years 5-6) teachers for their obligatory unit on electricity. It is most appealing as it is the most clearly stated out of all of ten indicators listed for this particular outcome. Other basic ideas in physics, like the separation of force and motion, are not indicated in the document. To us, that is the *big idea* that should form the basis of planning for a unit focusing on achieving the PP S3.4 outcome. However, in order to understand how the big idea of the separation of force from motion can be taught, teachers need to see how their stage 3 students will be able to apply the concept in a tangible assessment product. Now the process of backward mapping is set in train. The teachers need to ask themselves, *what assessment milestones need to be demonstrated along the way in order to demonstrate that the students have accessed the big idea?* For this outcome, it might be students demonstrating the forces

involved in the motion of a wheeled conveyance, like a bicycle. As well, students might draw a detailed diagram of the forces and motion(s) evident in the equipment at their local playground. We argue that the material product of the assessment task provides a good guideline form which to plan purposeful teaching and learning activities. The big idea, or the science concept, is not enough for primary teachers to base their planning on. They need to have a concrete vision of where the unit is heading in the guise of a tangible assessment product. This is why we believe that the tenets of social constructionism provide a more useful heuristic for teacher educators working in teacher planning than constructivism.

## **Social Constructionism and Pre-Service Teacher Educators**

In our work with pre-service teachers, we have developed a number of ICT (Information Communication Technology) electives, built on the tenets of a social constructionist epistemology, and the pedagogical concept of backward mapping. For example, one of the subjects we both teach involves students learning to use a range of digital devices (scanners, cameras, video cameras) to enhance teaching and learning. Using the concept of backward mapping, we developed as an assessment task, the production of a digital video, and movie poster. These tasks provide students with the opportunity to demonstrate their achievement of the outcomes of the subject, that include competency with digital imaging devices and software. Backward mapping, our curriculum involved teaching students about the processes of film production (including storyboarding, script-writing, camera techniques, non-linear video editing, and 'visual literacies' based on the work of Kress and van Leeuwen, 1996), and multi-layered, multi-modal image editing. The production of the film and poster involved students working in cooperation with each other, learning the 'tools' of the culture of digital video production, and thus was underpinned by our social constructionist philosophy.

Another of our subjects entitled "Web Pedagogies", involved a series of assessment tasks that would give students the opportunity to demonstrate their competency in web design, online publishing protocols, and what we have come to term 'web pedagogy', or the educational use of the internet (in a classroom where teacher and student are not separated by time or space). Given that this subject was to be made available to teachers in the field, as well as students enrolled in our pre-service teacher education programs, we began by considering what type of assessment items would not only demonstrate the outcomes we wanted students to achieve, but allow for the production of artefacts that demonstrate theoretically informed practice without resort to rarefied knowledge tests or 'forms of life' that are properly the products of different 'communities of inquiry' (Dewey, 1902), or 'communities of practice' (Lave & Wenger, 1991). Thus, in social constructionist fashion, we considered first *the 'typical' practices* of the community that we desired our students to demonstrate competency within.

The tasks that we finally settled on included the production of a *topic hotlist*, *structured controversy online*, a multi-page *three level treasure hunt*, and a full-blown *webquest*. Following recent research on quality teaching, the tasks the students create within each of their portfolio items must demonstrate a focus on intellectual quality, mechanisms for a supportive learning environment, and significance beyond the

classroom. While the 'topic hotlist' and 'webquest' arise out of the work of Bernie Dodge (1995) at the University of San-Diego, the 'structured controversy online', and 'three level treasure hunt' both represent an attempt to increase the intellectual quality, social support mechanisms, and significance of internet-based digital learning objects (DLOs), by modifying the less sophisticated 'subject sampler' and 'knowledge hunt' tasks advocated by other 'web pedagogues' (March, 1998). Each of the four assessment tasks combine to form a web pedagogies portfolio. Students move from the relatively simple topic hotlist, consisting of an annotated list of links to web resources on a topic of choice, to the production of more sophisticated websites demonstrating advanced navigation and page framing skills, as well as increasingly 'rich' forms of interactive pedagogy. The portfolio, as an assessment task, documents the pre-service teacher's growing knowledge of both web design and web pedagogy (the 'big ideas' we wanted them to take away from the subject).

Deciding what tasks would make up the web pedagogies portfolio was not only the first step in our 'backward mapping' process, but subsequently dictated the curriculum that would need to be followed so that the students had the opportunity to be successful in completing each element of the portfolio. The social constructionist philosophy underpinning this process is evident in the tasks that were selected as part of the portfolio. They represent artefacts that might be produced – at some level of sophistication – by a teacher within a teaching-learning community (who had an interest in using the internet as a tool to foster intellectual quality). Thus, the items in the portfolio are in some sense 'real world' tasks. They are just as likely to emerge from a web-savvy teaching-learning community as they are from within a university pre-service teacher education course. Although in order to produce the items pre-service teachers will undoubtedly have had to alter their existing cognitive maps of their world, assimilating or accommodating new information, the main focus of these assessment items is the demonstration that the pre-service teacher's 'pedagogic practice' has been enriched, or reconstructed. More importantly, this reshaping of social practice occurs not by long periods of didacticism, but by a pedagogy of construction within a socially supportive environment.

For this web pedagogies subject, we adopted a cyclic model, whereby periods of modelled, guided, independent, and troubleshooting activity characterised the instructional design. After seeing an 'expert' (lecturer) in the community of web pedagogues develop a topic hotlist, the students were guided to produce their own. They were then left to their own devices to complete the production of their portfolio item, with the inevitable result that problems would arise (they were using technology after all!). In a follow up session, any problems the students had had in developing their portfolio item were then addressed by the lecturer. The final product was then fine tuned before publication, and the cycle commenced once again. This instructional design process emphasizes the fact that learning is more than a cognitive activity in which our knowledge maps are changed (a social constructivist view), and highlights instead a conception of learning as a process of appropriating the practices of a particular community or social network (the social constructionist standpoint). When dealing with teacher education, which aims to produce teachers who don't only 'know' what to do, but can actually 'do' something productive, informed by what they 'know', we find social constructionism a more useful framework for pedagogy and curriculum development.

## Conclusion

In this paper we have argued that social constructionism is more useful as a theory to guide curriculum development than constructivism, because it allows the teacher to focus on what products are the typical 'forms of life' or 'social practices' of a given 'community of practice'. This allows the teacher to consider what products might be used for assessment, that would give the best indication of the student's competency in the typical practices of the community in question. Backward mapping from the selected assessment item, the teacher is then able to construct an appropriate curriculum that will scaffold, or support students in being developing the competencies and understandings they need to successfully produce the desired assessment item. This process aligns backward mapping with a social constructionist logic, that is concerned with students' ability to appropriate a given set of practices, rather than simply acquire an intellectual understanding of those practices without necessarily being able to demonstrate them. Obviously, the combination of backward mapping and social constructionism has been useful in addressing the issues we have faced when teaching pre-service educators the knowledge and skills involved in using effectively, information communication technologies within the classroom. However, we believe that this approach will also be effective for the appropriation of other social practices required of a competent teacher. Thus, we have tried to demonstrate that by emphasising 'construction' of real world products over the reorganisation of schemata, the adoption of backward mapping and a social constructionist epistemology, makes curriculum planning more effective in teacher education courses.

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